

CHAPTER 17

CASE STUDIES

Background:

Three case studies are included in this Plan -- the 1991 Oakland Firestorm, and the City of Los Angeles and the City of Santa Clara responses to the 1994 Northridge earthquake. The case studies examine how each city established diversion programs to handle the disaster debris generated within their communities and offer some lessons learned and planning guidelines for future events.

This information is presented in the hope that other jurisdictions can learn from these cities' experiences and incorporate these suggestions into their own pre-disaster plans by maximizing water diversion efforts and utilizing existing resources to the greatest benefit.

Contents:

This chapter consists of three case studies documenting debris management programs instituted after major disasters.

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CASE STUDY

OAKLAND FIRESTORM CURBSIDE PICKUP OCTOBER 20, 1991

Background:

The firestorm that raced through the Oakland Hills on October 20, 1991, destroyed vast amounts of property and vegetation. In fact, to date, it has been recorded as the most expensive fire in history, with the cost of structural damages estimated at \$1.5 billion. A disaster of this magnitude obviously results in an enormous solid waste disposal problem. The following are some of the issues and conclusions resulting from the City's efforts to collect the debris from that firestorm.

Initial Response:

The initial concern for the City was removal of the imminent hazards. The City's primary response to this concern was to provide access to affected areas and remove imminent hazards and hazardous materials. This included the removal of burned automobiles, identifying and removing dangerous and unstable structures and trees, capping exposed sewer and gas lines, installing temporary traffic controls, and identifying and removing hazardous materials.

Erosion Control:

The next immediate priority for the City was the prevention of soil erosion and potential landslides. This was a major concern due to the topography of the Oakland Hills, compounded by the lost vegetation, and the pending wet season that was quickly approaching.

Local contractors. To address this concern, the City enlisted the help of local contractors, the California Conservation Corps, and the East Bay Conservation Corps to install silt fences and hay bales along the hillside to impede landslide. Additionally, the entire burn area was targeted for aerial seeding, while other lots were treated with hydraulic mulching and hydroseeding.

Later in the recovery period, wood recovered was ground up and used as mulch, compost or topsoil additives. In spite of

the significant amounts of rain the area received, no erosion problems were reported.

Cleanup:

The hazardous and household hazardous wastes were targeted for removal before the City clean-up could begin. The City contracted with a private firm to remove visibly obvious household hazardous wastes. Property owners were not charged.

Additional information on household hazardous waste is addressed in Chapter 10, Household Hazardous Waste Program, of this document.

By December 6, 1991, most of the hazardous materials and unstable structures were removed, and full-scale clean-up commenced shortly thereafter. The City contracted with ICF Kaiser Company to clean up the debris.

Master contract:

The City Manager is authorized by emergency ordinance to take action for the protection of life and property in a disaster.

The City of Oakland used the approach of a master contract whereby one prime contractor was hired to oversee the overall cleanup operation, supported by a number of subcontractors. The City began the clean-up in December, 1991; the clean-up was completed six months later.

Zones:

The affected area was divided into three areas, which were each serviced by subcontractors. All general fire debris that was disposed of in a landfill was initially considered hazardous material, under guidelines of the Alameda County Department of Environmental health. Consequently, the debris had to be kept in dedicated cells away from the active municipal solid waste disposal areas.

Negotiate with insurers:

The City also instituted an innovative approach to negotiating payment for cleanup work with FEMA and the major insurers. Insurance companies, FEMA, and OES are all key players in the disaster recovery process. It is essential that each agency agree to their respective roles and responsibilities in handling disasters.

On behalf of the City and residents, the City negotiated with insurance companies and FEMA for reimbursement of the cleanup costs. The City estimated the clean-up costs based on the FEMA/City scope of work. The City then presented the insurance companies with an average clean-up cost per policyholder. The City based the cost estimate on ten kinds of properties, with categories such as a townhouse, upslope/downslope small house, medium house, estate, etc.

ICF Kaiser, the prime contractor, prepared estimates for each category; the estimates were then given to the insurance companies. The insurance companies also prepared their own estimates. The City proposed to FEMA that the insurance company pay the first 75% of the cost, and that FEMA pay the difference.

It was subsequently agreed that the insurance company would pay up front one-third of the cost of clean-up and that the residents would bill the insurance company for the remainder.

Cleanup costs:

In general terms, two thirds of the clean-up costs were covered by homeowners' insurance, while one third was covered by the Federal Emergency Management Agency (FEMA).

NOTE: In meeting with the insurance companies, the Insurance Commissioner had to approve the release of policyholders' names to the City.

- Foundation removal:** FEMA paid for the uninsured. Jurisdictions should note that FEMA does not pay for foundation removal and will deduct foundation work from the resident's policy. FEMA, however, will pay for the debris company to remove debris from the homesite.
- Material recovery:** Bid specifications for the contractors to remove the debris stated that the contractor is responsible for removal and transportation of cut trees to proper recycling or recovery facilities, and that the contractor must segregate metals, concrete, and other recyclables from nonrecyclable debris at the site of generation.
- In addition, the City provided contractors with the names of Bay Area construction and demolition waste recyclers, and required contractors to provide weekly load verification reports to prove that the materials were entering a recycling facility.
- Independent clean-up:** Property owners not wishing to participate in the City sponsored clean-up were given an opportunity to arrange their own clean-up. If the property owner did not complete the clean-up within a given window of opportunity, the City would initiate its own clean-up.
- Residents were not required to recycle material if they did not participate in the City's program. Individuals that did not participate in the City's clean-up did, however, have an incentive to recycle, as a significant cost savings could be achieved when compared to landfill disposal.
- Estimate quantities:** The City was unable to estimate the percentage of debris that was recyclable, but did compile figures on total tonnages recycled.
- The City recycled 10,498 tons of material and collected total of 90,213 tons.

Materials:

The material was broken down into four primary categories:

- ◆ metal (3,828 tons),
- ◆ wood (2,229 tons),
- ◆ concrete and brick (4,441 tons), and
- ◆ general debris (80,485 tons).

It is estimated that the City removed, prior to the initial response phase of City clean-up, 2,000 burned automobiles with another 700 trees removed by Pacific Gas and Electric.

Materials generated:

The uses and markets for the materials generated are described below:

- ◆ The majority of scrap metal was shredded locally and sold to steel mills and smelters.
- ◆ The concrete and brick was crushed and reused in road base material (for more information see Attachment A, fact sheet on Recycled Aggregate).
- ◆ Approximately 5,835 cubic yards of brick remained on burned lots to be reused and did not count in the disposal or recycled tonnages.
- ◆ Much of the wood that was recovered is being stored waiting for a market. Approximately one third of the recovered wood was used for biofuel. It is estimated that half the wood recovered was ground up and used as mulch or compost with the burned parts being converted to topsoil additives.

ATTACHMENT**A. Fact sheet on Recycled Aggregate**

CASE STUDY

CITY OF LOS ANGELES FOLLOWING 1994 NORTHRIDGE EARTHQUAKE CURBSIDE PICKUP PROGRAM

Background: The City of Los Angeles chose to address the issue of collection and processing of earthquake debris through private contractors. The City determined that it was most effective to use the existing expertise of established businesses in the area to address debris collection and processing. The anticipated result would be a shorter learning curve for waste handling and a potential expansion of permanent facilities to process mixed and segregated wastes after cleanup activities were completed.

RECYCLING PROGRAM

Overview: The City of Los Angeles developed a Demolition and Debris Removal Program to handle the debris generated from the 1994 Northridge earthquake. The purpose of the program was to collect residence curbside earthquake debris, and demolish 400+ damaged buildings.

The City collected 2,880,000 tons, and recycled 1,629,800 tons for a 56.5% recycling rate. The City saved approximately 6,350,000 cubic yards of landfill space through its recycling and demolition programs (1,629,800 tons).

Reimbursement: The City explored reimbursement for landfill space replacement costs. FEMA denied the City's request, stating that the City had too many disposal options available, including privately owned and operated facilities.

Recycling option: The City presented a recycling option to FEMA. FEMA also denied this proposal, stating that reimbursement is for "least cost alternatives." FEMA cited the fact that the City did not have a debris recycling disaster plan; further, upon an initial comparison, the recycling tipping fee was more expensive than the disposal fee.

Convince FEMA:

As a result, City staff was forced to prove that recycling should be allowed under the FEMA program. The City explained to FEMA that California law, AB 939, requires jurisdictions to reduce tonnage going to landfills. The City also noted that the recycling program was the most immediate and effective alternative for reducing the impact to landfills.

Based upon FEMA's practice of honoring local policies, the City of Los Angeles' policy of maximizing diversion in accordance with AB 939 and demonstrating the future impact to landfills' capacity satisfied this requirement.

Cost benefits:

The debris transported outside the area translated to a cost/ton ratio increase. In addition, the debris transfer via railroad would require construction of a transfer station and would increase the cost/ton ratio.

Other factors in support of the recycling program were that the additional hauling expense, which added up to a two-hour wait at the landfill, was more costly than a 45-minute wait at the recycling facility. At \$65 an hour cost increase, the tip fee was not the bottom line expense.

Letters of support:

The City also provided letters to FEMA from the U.S. EPA and the CIWMB, which endorsed recycling activities and concurred with federal and state regulations/policies (see Attachment A).

**FEMA/OES
reimbursement
program:**

FEMA reimburses program costs; they do not give advances.

FEMA only pays overtime costs for force account personnel performing emergency work (debris removal). FEMA, however, will pay ALL eligible costs for contracted labor.

☐ **CURBSIDE PROGRAM SETUP**

Pilot program: The City initially conducted a pilot recycling program using three City contractors collecting debris at curbside to evaluate the potential for recycling and estimate disposal costs.

Due to the success of the pilot program, the City initiated a full-scale curbside pickup program using 30 to 50 contractors that were under contract to the City at any one time to collect earthquake debris at curbside. The City also maintained contracts with recycling facilities and landfills to ensure the debris reached the appropriate facility.

☐ **PROGRAM IMPLEMENTATION**

Facilities: The City used several processing and disposal facilities to foster competition which, in turn, would minimize tipping fees and travel time to facilities accepting both source separated material and mixed waste.

Contracts: The City awarded contracts to the contractors based on access to specific machinery to be used in curbside pickup of debris and the ability to mobilize quickly when notified of an area that needed removal of debris.

Diversion language: The contracts included language indicating the City's desires to maximize recycling and indicating that contractors were expected to utilize processing and disposal facilities under contract to the City in particular order of preference in order to achieve that goal. Once baseline disposal and recycling percentages were established in the pilot program, the City incorporated minimum facility recycling rates into the contracts.

Order of priority: The facilities are listed in an order that puts recycling facilities first. Contractors are permitted to go to disposal facilities when recycling facilities are closed, temporarily over capacity, or have waiting times which would inhibit efficiency of collection operations.

Authorization letters:

The City developed authorization letters that the haulers used in lieu of paying the tipping fee at disposal and recycling facilities. The authorization letter allowed the facility to bill the City directly and benefited the hauler who did not have to pay the fee and wait for reimbursement from the City. It also ensured that the contractors would use recycling facilities, since there was no cost to them (Attachment B).

Media campaign:

The City notified residents of the curbside program through a media campaign that encouraged separation of wastes and segregation of household hazardous wastes. The City would scout areas to maximize the effort of the collection crews in attempts to fill the capacity of a truck with a single waste material. This encouraged recycling and transport to source separated recycling centers at a lower facility cost.

**LESSONS LEARNED****Background:**

The City, and subsequently the State, gained valuable experience from the cleanup of the Northridge earthquake. A great deal of material was recycled and many of the programs implemented during the cleanup will remain as permanent recycling facilities that will help the City achieve waste diversion mandates established in Assembly Bill 939.

As with any program of this magnitude, along with the successes, there are aspects of the program that would be approached differently if the opportunity presented itself again. In other words - lessons learned.

Lessons learned:

The following are some of the lessons learned by the City of Los Angeles, which are excerpts from correspondence with City staff and documentation compiled during the cleanup:

1. Disaster plan must be flexible.

Revise plan

The City indicated that any plan, no matter how well thought out, must be amended at some point in the process. Therefore, those who implement the cleanup must periodically review the operation and be willing to address shortcomings or unforeseen changes in either scope or implementation. Planning is imperative, but no one can anticipate all possible scenarios in addressing a disaster cleanup.

2. Scout neighborhoods.

Locate debris

The City of Los Angeles stressed that it is extremely important to identify the types and locations of debris piled up in the streets prior to dispatching crews to collect it.

This allows for:

- ◆ consolidation of similar types of debris (i.e. wood, aggregate, metal, wallboard, insulation), so that
- ◆ full loads of like material can be brought to source separated processing stations, thus
- ◆ minimizing transportation and disposal costs and increasing the likelihood that the materials will be recycled.

Debris identification

Debris identification can be accomplished in various ways. In hilly areas, the City of Los Angeles scoped the neighborhoods using City staff contractors and marking types of materials and locations on a map. Some contractors will do this prior to dispatching crews, but not necessarily. This is probably something that should be negotiated in the contract.

Although the City of Los Angeles chose to blanket the neighborhoods with mobile crews, a Geographic Information System could also be used for identifying locations. Regardless of the method, the primary goal is to maximize capacity of the cleanup crews while collecting as much similar types of debris as possible.

3. Notify residents of program.

Get the word out

This point may seem obvious, but there are several potential barriers to disseminating information on a curbside pickup program. A City's public outreach program should evaluate all forms of media including: newspaper ads, radio public service announcements, and television public access stations. Be aware of communities where multiple language ads will be necessary. Also, be prepared to pay for the ads. The City of Los Angeles was quoted a price of \$16,000.00 for a quarter-page ad in the *L.A. Times*.

4. Consider only collecting source separated material at the curb.

Source separate

Although the City of Los Angeles did not institute this requirement in its curbside pickup program, staff indicated that source separation is something they would require in future disaster cleanups.

The City of Santa Clara imposed this requirement during cleanup of its earthquake debris and made it work. This would require extensive notification that only source separated material would be collected for free.

Reduce costs

Mixed material could be tagged, and if not removed by the owner within a given time period, be collected for a fee. This could significantly reduce disposal costs, as the majority of materials could go to source separated processing facilities.

5. Institute incentive for haulers

Educate haulers

City staff indicated that one of the most difficult aspects of the program was both educating the haulers on the preferable sites to haul the material to and then ensuring that they followed through on the instructions. As indicated above, the City placed recycling facilities in higher preference to mixed disposal facilities. However, the recycling facilities may not be the most preferable facility in the hauler's mind.

Basis for choosing

The hauler may choose a facility based on distance, familiarity, or absence of truck scales on route rather than recyclability of material or disposal cost, as the City bore the brunt of these costs.

Training

The City developed a training guide entitled *Northridge Earthquake Recycling Requirements for C-21 Contractors*, which lists the City's requirements, materials specifications, and recycling and disposal facilities. All haulers were given the manual and trained on program guidelines.

Even with the training, the City needed to constantly police the haulers to verify that the loads were taken to the preferred locations.

Primary site

An attempt was made to designate a primary disposal/recycle location on a ticket to be presented to the facility operator. If the load was rejected, or the facility was full, the ticket would be stamped at the facility and the load was to be taken to the next facility listed. This was only partially successful.

In some cases the drivers changed the location listed on the tickets avoiding the hierarchy altogether. This process is also very resource intensive as inspectors are needed at each cleanup site prior to hauling to mark the tickets.

Incentive program

In conclusion, the City felt the method that had the most potential for success in ensuring that the high priority facilities (recycling) were visited first, involved some sort of incentive program. If the drivers received some sort of perk for adhering to the criteria, more material would be recycled and a great deal of money would be saved in the form of reduced tipping fees and reduced staff time dedicated towards policing cleanup crews and haulers.

6. Continual oversight by inspectors is needed.

Oversight

As discussed in the previous item, oversight is needed to ensure that the hauler goes to the preferred facility. Additional oversight is needed for the crews loading the debris to ensure that material separation techniques are used.

Inspectors

Inspectors, or incentive programs, are needed to ensure that full loads are taken to the processing facilities rather than half empty trucks. Under the current system, there is no incentive for a hauler to completely fill a truck before going to the disposal/recovery facility. The haulers are paid for their time rather than by weight. The City felt this was necessary; otherwise, there would be no incentive to haul low density materials such as wood and insulation.

7. Document time and cost expenditures.

Documentation

This is extremely important if a jurisdiction anticipates reimbursement from the Federal Emergency Management Agency (FEMA). Comprehensive documentation of all expenditures related to addressing a disaster is necessary for reimbursement through FEMA.

8. Dedicate resources towards segregating waste at curbside prior to commingling during collection.

Contamination

The City of Los Angeles initially collected waste, as is, at the curbside. Unfortunately, a small amount of contamination, such as wood in a pile of concrete rubble, would require the entire load to go to a mixed waste disposal facility or recycling facility. The resulting tip fee would be considerably more than that at a segregated processing facility.

The City then began using crews to pick through piles of debris that had slight commingling of waste to produce individual piles of separated waste that could be hauled to source separated facilities at a reduced disposal cost.

Any jurisdiction that is considering using this type of labor should investigate the potential use of crews from the California Conservation Corps (CCC) or the Employment Development Department (EDD).

9. Plan ahead and secure funds.

Pre-planning

The most important part of a successful curbside collection program is preplanning. Planning is necessary if the program is to be implemented in a timely manner, and funding is necessary if it is to be implemented at all. Even if the program is eligible for reimbursement from a federal program such as FEMA, the FEMA reimbursement will not occur immediately. There needs to be some sort of funding mechanism in place until reimbursement occurs.

ATTACHMENTS

- A. Letters to FEMA from the U.S. EPA and the CIWMB, which endorsed recycling activities and concurred with federal and state regulations/policies.
- B. City of Los Angeles authorization letter.

CASE STUDY

CITY OF SANTA CLARITA 1994 NORTHRIDGE EARTHQUAKE RESPONSE

Background:

The following case study highlights some of the actions taken in the area of waste diversion by the City of Santa Clarita in its efforts to clean up after the Northridge Earthquake. The City of Santa Clarita is located 35 miles northwest of Los Angeles and has a population of 140,000. The City is located 12 miles from the epicenter of the Northridge quake, which struck on January 17, 1994.

Following that disaster, the City implemented a program designed to expedite the cleanup of rubble and to maximize reuse and diversion of the debris resulting from construction and demolition activities that resulted from the earthquake.

Damage:

The Northridge earthquake, and the following aftershocks, resulted in damages estimated at \$300 million citywide. The City compiled data through December 31, 1994, and estimated that it provided free removal and recycling of more than 250,000 tons of earthquake debris, which resulted in a 97% recycling rate. The City expected to be dealing with debris, including that generated from rebuilding, through 1996.

Recycling program:

The City was able to develop and implement an extremely efficient debris recycling program considering that there was no disaster debris management plan in place prior to the earthquake.

Due to the overall success of Santa Clarita plan, other jurisdictions should consider evaluating some of the actions taken by this city and implementing them, in part or as a whole, into their own debris management plans to minimize the amount of waste that is ultimately disposed of in local landfills.

☐ SUMMARY

References:

The following actions taken by the City of Santa Clarita in response to the Northridge earthquake were compiled from information contained in the *City of Santa Clarita Disaster Debris Recycling Reference Guide, Northridge Earthquake, January 17, 1994* and from information obtained from a conversation with Hazel Joanes, Solid Waste Coordinator for the City of Santa Clarita.

3 phases:

The debris resulting from the January 17, 1994, earthquake was generated in three distinct phases.

Error! Bookmark not defined.Phase	Cleanup activities
1	The first phase took the form of mixed debris, which included everything from demolished structures to putrescible waste.
2	The second phase consisted primarily of demolition material from residents clearing their properties of damaged structures.
3	The final phase, which may continue for some time, consists of the waste generated from the new construction and remodeling as residents rebuild, fix, and/or upgrade structures damaged from the earthquake.

Delays:

The renovation and rebuilding phase in any large scale disaster can be delayed beyond what is normally anticipated. This can be due, at least in part, to the following:

- ◆ delays in payments to homeowners from FEMA disaster assistance;
- ◆ delays in payments on insurance claim benefits;
- ◆ inability of regional contractors to keep up with the large volume of work needed; and
- ◆ general economic conditions (during times of high unemployment or lowered property values, property owners are unable or unwilling to go into debt to finance repairs).

Putrescibles: Immediately following the earthquake, the City needed to clear avenues and remove mixed waste, which included putrescible material, to help restore the infrastructure and protect health and safety. The urgency of these needs compounded by the composition of the waste precluded the City from recovering much of this material.

Disposal sites: Because of the earthquake damage to the freeways, the City of Santa Clarita was unable to transport waste to its disposal facility. As a result, on January 25, 1994, the City signed an agreement with Kern County for use of the Bena Sanitary Landfill for permission to dispose of up to 250 tons per day for up to six months.

This agreement was necessary because the Kern County Ordinance requires written authorization from the Board of Supervisors to dispose of out-of-county waste in county landfills.

Mutual aid: Mutual aid agreements between nearby jurisdictions for use of equipment, labor, or disposal capacity in the event of a disaster is worth considering as part of a disaster preparedness plan.

Diversion activities: Once the waste that threatened public health and access was cleared, the City began to address the issue of maximizing waste diversion efforts.

The City began setting up a temporary resource recovery facility to process the disaster related debris.

Disaster debris defined. The City defined disaster related debris as broken concrete, asphalt, block wall rubble, masonry debris, cinder block, clay brick and construction metals attached to masonry (rebar), scrap metal and wood wastes.

Program features: The City's proposed program to collect and divert the disaster debris had five primary features. They were:

#	Feature
1	No tipping fees. This would discourage illegal dumping.
2	Enforcement of illegal dumping prohibition.
3	Provision of debris diversion information.
4	Assurance against hazardous materials or contaminated inerts being dumped.
5	City to assume ownership of material product to ensure reuse.

Ownership of materials:

The City determined these features would maximize recovery and diversion while maintaining an effective collection effort. It should be noted that the City did **not** assume ownership of the material product as proposed in #5.

The City found it more effective to have a contractor assume ownership of the material. Diversion was achieved because the contractor had recycling mandates written into its contract with the City.

FEMA reimbursement is reduced by revenues. The City discovered that assuming ownership of the products and the subsequent revenues from sale of those materials would impede reimbursement from federal disaster relief programs.

Contracts:

In contracting for its clean-up services, the City issued one contract whereby the contractor was responsible for the full range of clean-up activities--collection, hauling, processing, and marketing of the materials. The contractor in turn hired subcontractors to handle various aspects of the clean-up operation.

Temporary storage: The City then secured a 40-acre site for stockpiling and processing the disaster debris. This is an excellent consideration if the land is available. It allows far better recovery and processing of waste.

Permits: Any jurisdiction considering this option should be aware that permits may be required for various state agencies including the Water Resources Control Board, Air Resources Board, and the California Integrated Waste Management Board as well as any local permits that may apply.

Roll-off containers: The City established contracts with three local trash hauling and debris management companies. The City concluded that curbside pickup of earthquake debris would be the most effective method. The City considered using roll-off containers as a collection choice, but dismissed it due to the following reasons:

- ◆ In order to achieve a high level of service, it would require a roll-off box on every corner. It is doubtful that any company could supply this.
- ◆ Roll-off container use would increase the amount of mixed waste deposited in them. This in turn, would reduce the recycling rate.
- ◆ Removing waste from the bins presented the potential for extra equipment since loaders are needed to get debris to dumping level.
- ◆ Roll-off bins represented a potential increased liability.
- ◆ The bins also posed a potentially greater traffic hazard, causing blind spots from roll-offs at every corner versus occasional piles of debris at the curbside.
- ◆ The cost for roll-off bins is potentially more than curbside pickups programs. Beyond the initial capital outlay, the City had to consider that FEMA will only reimburse low cost bid.

CONSIDERATIONS IN DEVELOPING A DEBRIS MANAGEMENT PLAN.

Evaluation factors:	The following are all considerations that should be evaluated when a jurisdiction is planning to implement a disaster-related debris collection and management plan.
Labor:	The City was able to obtain labor assistance from the California Conservation Corps (CCC). This is another area the should be investigated when evaluating manpower needs. Cities and counties developing disaster debris management plans should also evaluate the potential to use manpower from the Employment Development Department (EDD) and neighboring jurisdictions.
Public outreach:	<p>Another critical aspect in developing a successful waste diversion program, regardless of whether it is for disaster debris, involves public outreach.</p> <p>The City of Santa Clarita notified the public of the curbside pickup program through numerous press releases. The press releases included information on:</p> <ul style="list-style-type: none">◆ waste diversion requirements,◆ household hazardous wastes,◆ materials being collected,◆ recycling centers, and◆ requirements to separate the materials for free pick up. <p>The City also published newsletters and flyers on specifics and/or modifications to the program.</p>
Material separation:	The City was able to achieve the high recycling rate by requiring separation of material types at the curb by the residents that wanted the material hauled for free by the City.

The City notified residents of the:

- ◆ materials collected,
- ◆ the names of the haulers that were collecting the material, and
- ◆ lists of local businesses that were accepting recyclables and items for reuse.

Additional notifications were made to the public regarding the available assistance of the CCC in removing block wall rubble and building materials from the curbside and public right of way and any steps that needed to be taken to keep desired materials.

Program extended:

The City of Santa Clarita concluded that debris collection needed to be extended to address the ongoing demolition, renovation, and construction being conducted by its residents. On August 22, 1994, the City extended the collection program through December 15, 1994.

Encroachment permit:

The City notified its residents of the extension along with the requirement that an encroachment permit be obtained prior to placing debris in the gutter.

The City used the encroachment permits as a mechanism to determine where the various materials were being placed, as well as a way of notifying residents that free collection was only provided for those who did not receive FEMA or insurance payments for debris removal.

When residents applied for permits, they were required to sign a statement that they had not been reimbursed for any hauling charges. The City stated that some residents sent in checks to reimburse City for hauling away debris.

Successful program: Overall, the City's program was very successful in recycling and diverting a high percentage of the debris generated from the Northridge earthquake. This is particularly true in light of the fact that the City did not have a comprehensive disaster debris diversion plan in place prior to the earthquake. The City's success can be attributed, at least in part, to its ability to react quickly and to a high level of participation and cooperation by its residents.

PLANNING GUIDELINES

Lessons learned: Although the City's program for diverting waste was a success, other jurisdictions may not experience this level of success without a considerable amount of pre-disaster planning.

With that in mind, the following lessons learned from the Santa Clarita case can be summarized and evaluated by other jurisdictions and potentially incorporated into their own pre-disaster plans in hopes of maximizing waste diversion efforts and utilizing existing resources to the greatest benefit.

☐ 1: Plan for a Disaster

Successful program: Although the City of Santa Clarita response to the January 17, 1994, earthquake was more reactive than proactive, it was still quite successful at diverting a high percentage of the debris generated.

However, most jurisdictions will find that they need to develop a waste management plan for disaster debris if they hope to recycle a reasonably high percentage of the waste generated.

Benefits: By recycling and reusing the debris, a local jurisdiction can save landfill space, help achieve the waste reduction mandate of 50% by the year 2000, and potentially foster new businesses or expand existing operations in the area that process construction and demolition debris.

A good disaster debris management plan will anticipate the types of disaster most likely to occur in the area, and will anticipate the manpower, equipment, processing, storage, and disposal needs.

☐ **2: Assess Processing and Storage Capabilities and Needs**

Centralized site: The City of Santa Clarita found that setting up a centralized storage and processing site greatly enhanced its ability to process and reuse the demolition debris.

When planning for disaster waste management, jurisdictions should determine if centralized storage and processing is an option to pursue. If so, a local, adequate site should be located along with an assessment of the types of permits needed for the site and contacts of appropriate regulatory agencies that would issue the permits.

Sale of recyclables: A jurisdiction should also determine if processing and income from the sale of recyclables will be handled through a contract or not. Ownership and subsequent income from the sale of recyclable debris may have an effect on the amount that is reimbursed from federal agencies such as FEMA. This will need to be evaluated on a case-by-case basis.

Local business capabilities: A good pre-disaster plan will also document local businesses that either process or have the capabilities to process construction and demolition debris.

These types of operations could assist in the processing needs for disaster debris, or gear up to handle the added flow of debris. If successful, a jurisdiction may have new or larger construction and demolition waste processing and recycling operations established after the disaster recovery than it had before.

☐ **3: Assess Labor and Equipment Needs**

Local jurisdictions will not likely have adequate labor and equipment available to handle the tasks of collecting the increased waste generated immediately following a disaster.

Mutual aid: One way to address this need is through a mutual aid agreement with nearby jurisdictions for manpower and equipment. The drawback to this approach is, if the disaster is widespread, the adjacent jurisdiction will likely need its own equipment making it unavailable for others to use.

The City of Santa Clarita was able to employ the assistance of the California Conservation Corps (CCC). Local jurisdictions should look into employing the resources of the CCC or the Employment Development Department (EDD) for the immediate labor needs following a disaster.

☐ 4: Determine Debris Collection Method

Curbside pickup: The City of Santa Clarita chose to implement curbside pickup rather than using roll-off bins for the reasons stated above. The City also implemented a policy requiring separation of materials at the curbside, which greatly enhanced its ability to recycle the materials.

Source separation: Any jurisdiction considering implementing a free program to pick up materials should consider requiring material separation at the curb and implementing some mechanism to enforce it.

The City of Santa Clarita experienced an overall high rate of participation and compliance from its residents. This may not always be the case, especially in larger jurisdictions.

To avoid commingling of debris at the curbside, jurisdictions should consider a mechanism, such as a surcharge, for picking up commingled debris after the initial right of ways have been cleared.

Encroachment permit: The City of Santa Clarita also required residents to obtain an encroachment permit before the City removed the debris

from the curb. The City found that the permit process allowed them to track and coordinate pick-up locations as well as notify residents of any requirements they must meet for the free hauling and disposal service.

☐ **5: Implement Public Outreach**

Participation:

The success of any waste diversion program is determined by the overall participation of the its local residents. The first step in achieving a high rate of participation involves notifying the public of the services available, the goals of the program, and any limitations on the types of materials being collected.

The forms of media used to advertise the program are limited only by the budget allocated. Consideration should also be given towards providing notification to any large non-English speaking populations within the jurisdiction.

☐ **6: Provide Adequate Funding Mechanism**

Funding delay:

Although many of the costs associated with clean-up following a disaster may be reimbursed through programs administered by the State or FEMA, there will be a delay between the time the operation begins and the point that state and federal funding begins. Local jurisdictions will have to fund the initial clean-up in at least the short term. A good disaster plan will anticipate this.

☐ **7: Document Activities**

Reimbursement:

Documenting both the steps taken to divert disaster debris as well as tons diverted will serve several purposes.

First and foremost, for FEMA reimbursement, documentation is required to prove that least cost disposal was used. In some cases, recycling operations will be reimbursed even if they cost more. However, in such cases, the jurisdiction must document that recycling the material is required in an ordinance or charter.

Documenting diversion activities will also assist a jurisdiction in meeting the state mandated waste reduction requirement of 50% by the year 2000.

Finally, documenting the steps taken to divert waste following a disaster will serve as a chronology of activities, based on the successes or failures, to repeat or avoid in future disasters.

☐ 8: Evaluate the Need to Extend Collection Efforts

Estimate program length:

In all disaster debris collection programs, an initial estimate will need to be made on the type and length of services to be provided. As the collection program progresses, periodic assessments of those initial estimates will need to be conducted to determine if any significant modifications will need to be made.

The City of Santa Clarita began assessing the need to extend the collection program around August, 1994. Based on the continued generation of waste from the residents, the City extended its collection program through December 15, 1994.

Program delays:

The City concluded that the continued generation of waste by its residents could be attributed primarily to delayed rebuilding activities. Many of the residents delayed upgrading or repairing damaged structures because of delays in payments from insurance companies or federal assistance. This was compounded by the inability of local contractors to keep up with the high demand for their services following the disaster.

Rebuilding issues:

Local jurisdictions should consider the inevitable lag in building activities that may follow any large scale disaster. Insurance company claims and federal assistance delays will almost certainly increase with the number of residents that are affected. The same can be said for a given number of established local craftsmen and contractors. As the market for their services dramatically and instantaneously increases,

the length of time needed to perform the total number of jobs will also increase.

Extend program. Although each jurisdiction is different in its size, markets, and disaster potential, it is worth the time to consider contingencies in a collection program following a disaster. Plans should be made for potentially extending the program as well as for changes in the types of waste generated.

Wastestream. As the rebuilding process begins, waste streams should vary in composition and be more segregated. The segregation is a natural result of the phases of construction, while the composition would depend on the type of building activities occurring. Beyond actually extending the services, plans should be made to notify the public of any changes in collection procedures and renotifying residents of the eventual discontinuation of the collection.

Conclusion:

The steps and activities taken by the City of Santa Clarita are only one example of options used by one jurisdiction. At the very least, other jurisdictions should evaluate those steps for applicability to potential disasters in their own areas.

Additionally, any actions incorporated into a disaster plan, should be addressed regionally to minimize overlap and confusion. Even if none of the steps in this case study is used, the process of planning for a disaster and the waste that will be generated will reduce the time, money, and efforts needed if that disaster ever occurs.